

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

Amendments to the Claims:

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1. [Previously Presented] A remote communication device comprising:
communication circuitry configured to at least one of receive communication signals and generate communication signals; and

an antenna coupled with the communication circuitry and substantially tuned to first and second different frequency bands, the antenna being configured to communicate wireless signals corresponding to the communication signals including at least one of receiving wireless signals and outputting wireless signals, wherein the antenna is simultaneously substantially tuned to the first and second different frequency bands.

2. [Original] The remote communication device according to claim 1 wherein the antenna comprises a microstrip antenna.

3. [Original] The remote communication device according to claim 1 wherein the antenna is configured to electromagnetically communicate with a return loss of less than or equal to approximately -9 dB within the first and second frequency bands.

4. [Previously Presented] The remote communication device according to claim 1 further comprising a power source coupled with the communication circuitry.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

5. [Original] The remote communication device according to claim 1 wherein the antenna is configured to receive the wireless signals, and further comprising another antenna coupled with the communication circuitry and substantially tuned to first and second different frequency bands, the another antenna being configured to output wireless signals.

6. [Original] The remote communication device according to claim 5 wherein the another antenna is configured to communicate via backscatter modulation.

7. [Original] The remote communication device according to claim 5 further comprising a quarter-wavelength transmission line coupled intermediate the communication circuitry and the another antenna.

8. [Original] The remote communication device according to claim 1 wherein the communication circuitry comprises radio frequency identification device circuitry

9. [Original] The remote communication device according to claim 1 wherein the frequency bands are centered at approximately 915 MHz and 2.45 GHz.

10. [Original] The remote communication device according to claim 1 wherein the antenna includes an impedance reduction conductor.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

11. [Previously Presented] A remote communication device comprising:
communication circuitry configured to at least one of receive communication signals and generate communication signals; and

an antenna coupled with the communication circuitry and configured to communicate wireless signals corresponding to the communication signals including at least one of receiving wireless signals and outputting wireless signals, the antenna being configured to simultaneously communicate at a plurality of substantially resonant frequencies.

12. [Original] The remote communication device according to claim 11 wherein the antenna is substantially tuned to the resonant frequencies.

13. [Previously Presented] The remote communication device according to claim 11 wherein the antenna is configured to electromagnetically communicate with a return loss of less than or equal to approximately -9 dB at the resonant frequencies.

14. [Original] The remote communication device according to claim 11 wherein the antenna is configured to receive the wireless signals, and further comprising another antenna coupled with the communication circuitry and configured to output the wireless signals at a plurality of substantially resonant frequencies

15. [Original] The remote communication device according to claim 14 wherein the another antenna is configured to communicate via backscatter modulation.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

16. [Original] The remote communication device according to claim 11 wherein the antenna includes an impedance reduction conductor.

17. [Original] The remote communication device according to claim 11 wherein the communication circuitry comprises radio frequency identification device circuitry.

18. [Original] A radio frequency identification device comprising:
communication circuitry configured to at least one of receive communication signals and generate communication signals; and ,

an antenna coupled with the communication circuitry and configured to electromagnetically communicate having a return loss less than or equal to approximately -9 dB at a plurality of frequencies, the antenna being configured to communicate wireless signals corresponding to the communication signals including at least one of receiving the wireless signals and outputting the wireless signals.

19. [Original] The radio frequency identification device according to claim 18 wherein the antenna is configured to receive the wireless signals, and further comprising another antenna coupled with the communication circuitry and substantially tuned to a plurality of frequencies, the another antenna being configured to output the wireless signals.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

20. [Original] The radio frequency identification device according to claim 19 wherein the another antenna is configured to communicate via backscatter modulation.

21. [Original] The radio frequency identification device according to claim 18 wherein the antenna includes an impedance reduction conductor.

22. [Previously Presented] A radio frequency identification device comprising:

communication circuitry configured to receive communication signals and to generate communication signals;

a first antenna coupled with the communication circuitry and simultaneously substantially tuned to a plurality of frequencies, the first antenna being configured to receive wireless signals corresponding to the received communication signals; and

a second antenna coupled with the communication circuitry and simultaneously substantially tuned to a plurality of frequencies, the second antenna being configured to output wireless signals corresponding to the generated communication signals.

23. [Original] The radio frequency identification device according to claim 22 wherein the antennas are individually configured to electromagnetically communicate with a return loss of less than or equal to approximately -9 dB at individual ones of the plurality of frequencies.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

24. [Original] The radio frequency identification device according to claim 22 wherein the second antenna is configured to communicate via backscatter modulation.

25. [Original] The radio frequency identification device according to claim 22 wherein the antennas individually include an impedance reduction conductor.

26. [Previously Presented] A radio frequency identification device comprising:

communication circuitry configured to at least one of receive forward signals from an interrogator and generate return signals;

an antenna coupled with the communication circuitry and configured to communicate wireless signals at one of a plurality of frequencies including at least one of receiving the forward signals and outputting the return signals; and

wherein the antenna is simultaneously substantially tuned to the frequencies at a moment in time.

27. [Original] The radio frequency identification device according to claim 26 wherein the antenna is configured to communicate at the one frequency responsive to a frequency of communication of the interrogator.

28. [Original] The radio frequency identification device according to claim 26 wherein the antenna is configured to receive the forward signals, and further

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

comprising another antenna coupled with the communication circuitry and configured to output the return signals at one of a plurality of frequencies.

29. [Original] The radio frequency identification device according to claim 28 wherein the another antenna is configured to communicate via backscatter modulation.

30. [Original] The radio frequency identification device according to claim 26 wherein the antenna includes an impedance reduction conductor.

31. [Previously Presented] A wireless communication system comprising:
an interrogator configured to emit forward signals; and
a remote communication device configured to at least one of receive the forward signals from the interrogator and generate return signals for communication to the interrogator, the remote communication device being configured to communicate wireless signals including at least one of receiving the forward signals and outputting the return signals at a plurality of frequencies using one antenna simultaneously substantially tuned to the frequencies.

32. [Original] The wireless communication system according to claim 31 wherein the interrogator is configured to output the forward signals at one of the frequencies.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

33. [Original] The wireless communication system according to claim 31 wherein the remote communication device is configured to communicate at one of the plurality of frequencies responsive to a frequency of communication of the interrogator.

34. [Original] The wireless communication system according to claim 31 wherein the remote communication device includes an antenna substantially tuned to the frequencies.

35. [Original] The wireless communication system according to claim 34 wherein the antenna is configured to receive the forward signals, and the remote communication device includes another antenna substantially tuned to the frequencies and configured to output the return signals.

36. [Original] The wireless communication system according to claim 34 wherein the antennas individually include an impedance reduction conductor.

37. [Original] The wireless communication system according to claim 31 wherein the remote communication device comprises a radio frequency identification device.

38. [Previously Presented] A wireless communication method comprising:
providing a remote communication device having an antenna simultaneously substantially tuned to first and second different frequency bands; and

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

communicating wireless signals using the antenna including at least one of receiving wireless signals at a frequency within one of the frequency bands and outputting wireless signals at a frequency within one of the frequency bands.

39. [Original] The method according to claim 38 wherein the providing comprises providing a remote communication device having the antenna configured to electromagnetically communicate with a return loss of less than or equal to approximately -9 dB within the first and second frequency bands

40. [Original] The method according to claim 38 wherein the providing comprises providing a remote communication device having a plurality of antennas individually substantially tuned to first and second different frequency bands.

41. [Original] The method according to claim 40 wherein the communicating comprises receiving using one of the antennas and outputting using another of the antennas.

42. [Original] The method according to claim 38 further comprising processing wireless signals using the remote communication device.

43. [Original] The method according to claim 38 wherein the providing comprises providing a radio frequency identification device.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

44. [Previously Presented] A wireless communication method comprising:
providing a remote communication device having an antenna configured to simultaneously communicate at a plurality of resonant frequencies; and
communicating wireless signals using the antenna including at least one of receiving wireless signals at one of the frequencies and outputting wireless signals at one of the frequencies.

45. [Original] The method according to claim 44 wherein the providing comprises providing a remote communication device having the antenna configured to electromagnetically communicate with a return loss of less than or equal to approximately -9 dB at the plurality of frequencies.

46. [Original] The method according to claim 44 wherein the providing comprises providing a remote communication device having a plurality of antennas individually substantially tuned to the plurality of frequencies.

47. [Original] The method according to claim 46 wherein the communicating comprises receiving using one of the antennas and outputting using another of the antennas.

48. [Original] The method according to claim 44 further comprising processing wireless signals using the remote communication device.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

49. [Original] The method according to claim 44 wherein the providing comprises providing a radio frequency identification device.

50. [Previously Presented] A radio frequency identification device communication method comprising:

providing a radio frequency identification device configured to communicate wireless signals at a plurality of frequencies using one antenna simultaneously substantially tuned to the frequencies;

receiving forward signals at one of the frequencies; and

outputting return signals at one of the frequencies.

51. [Previously Presented] The method according to claim 50 wherein the providing comprises providing the radio frequency identification device having the one antenna configured to receive the forward signals and another antenna configured to output the return signals.

52. [Original] The method according to claim 50 further comprising processing wireless signals using the radio frequency identification device.

53. [Original] The method according to claim 50 wherein the receiving and outputting occur at the same frequency.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

54. [Original] A wireless communication method comprising:
communicating a forward link signal at one of a plurality of frequencies using an interrogator;
receiving the forward link signal using one antenna of a remote communication device substantially tuned to the plurality of frequencies; and
outputting a return link signal using another antenna of the remote communication device substantially tuned to the plurality of frequencies.

55. [Original] The method according to claim 54 further comprising processing wireless signals using the remote communication device.

56. [Original] The method according to claim 54 wherein the receiving and outputting comprise receiving and outputting using a radio frequency identification device.

57. [Previously Presented] A method of forming a remote communication device comprising:
providing communication circuitry configured to at least one of receive forward signals and output return signals;
coupling at least one antenna with the communication circuitry; and
substantially tuning the at least one antenna to simultaneously communicate at a plurality of frequencies.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

58. [Previously Presented] The method according to claim 57 further comprising coupling a power source with the communication circuitry.

59. [Original] The method according to claim 57 wherein the providing comprises providing radio frequency identification device communication circuitry.

60. [Original] The method according to claim 57 wherein the coupling comprises coupling a plurality of antennas with the communication circuitry, one of the antennas being configured to receive wireless signals corresponding to the forward signals and the other of the antennas being configured to communicate wireless signals corresponding to the return signals.

61. [Original] The method according to claim 57 wherein the tuning comprises tuning using an impedance reduction strip.

62. [Original] A radio frequency identification device communication method comprising:

providing an interrogator;

communicating a forward signal at one of a plurality of frequencies using the interrogator;

providing a radio frequency identification device configured to communicate with interrogator;

receiving the forward signal using one antenna of the radio frequency

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

identification device substantially tuned to the plurality of frequencies;

processing the forward signal using communication circuitry of the radio frequency identification device after the receiving;

outputting a continuous wave signal using the interrogator after the communicating;

generating a return signal using the communication circuitry after the processing;
and

modulating the continuous wave signal according to the return signal using another antenna of the radio frequency identification device substantially tuned to the plurality of frequencies.

63. [Previously Presented] The remote communication device according to claim 1 further comprising a power source positioned with respect to the antenna to tune the antenna to one of the first and the second different frequency bands.

64. [Previously Presented] The remote communication device according to claim 4 wherein the antenna comprises a loop antenna and the power source is centered with respect to the loop antenna.

65. [Previously Presented] The remote communication device according to claim 11 further comprising a power source positioned with respect to the antenna to tune the antenna to one of the substantially resonant frequencies.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

66. [Previously Presented] The radio frequency identification device according to claim 18 further comprising a power source positioned with respect to the antenna to tune the antenna to one of the plurality of frequencies.

67. [Previously Presented] The radio frequency identification device according to claim 22 wherein the first antenna comprises a loop antenna, and further comprising a power source centered with respect to the loop antenna to tune the loop antenna to one of the frequencies.

68. [Previously Presented] The radio frequency identification device according to claim 26 further comprising a power source positioned with respect to the antenna to tune the antenna to one of the plurality of frequencies.

69. [Previously Presented] The method according to claim 38 further comprising tuning the antenna to one of the first and the second different frequency bands using a power source.

70. [Previously Presented] The method according to claim 44 further comprising tuning the antenna to one of the frequencies using a power source and an impedance reduction conductor.

71. [Previously Presented] The method according to claim 54 further comprising tuning the one antenna to one of the frequencies using a power source.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

72. [Previously Presented] The method according to claim 57 wherein the substantially tuning comprises using a power source.

73. [Previously Presented] The remote communication device according to claim 1 wherein the antenna is substantially tuned to the first and second different frequency bands having different respective carrier frequencies.

74. [Previously Presented] The remote communication device according to claim 1 wherein the antenna is configured to communicate at different substantially resonant frequencies corresponding to signals generated using at least one interrogator and which have different carrier frequencies.

75. [Previously Presented] The radio frequency identification device according to claim 18 wherein the plurality of frequencies correspond to different carrier frequencies of the communication signals.

76. [Previously Presented] The radio frequency identification device according to claim 22 wherein the first and second antennas are individually substantially tuned to the plurality of frequencies comprising carrier frequencies of the communication signals.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

77. [Previously Presented] The radio frequency identification device according to claim 26 wherein the frequencies comprise carrier frequencies of the forward and return signals.

78. [Previously Presented] The wireless communication system according to claim 31 wherein the antenna is substantially tuned to the frequencies comprising carrier frequencies of the forward signals and the return signals.

79. [Previously Presented] The method according to claim 38 wherein the first and the second different frequency bands have respective different carrier frequencies and frequencies of the frequency bands do not overlap one another.

80. [Previously Presented] The method according to claim 44 wherein the antenna is configured to communicate at the resonant frequencies corresponding to a plurality of different carrier frequencies.

81. [Previously Presented] The remote communication device according to claim 1 wherein the communication circuitry is configured to control reflection, by the antenna, of electromagnetic energy present at the remote communication device to implement backscatter communications.

82. [Previously Presented] The remote communication device according to claim 4 wherein the power source comprises a battery.

Serial No. 10/791,187
Response to January 4, 2007 Final Office Action

83. [Currently Amended] The remote communication device according to claim [[9]] 10 wherein the impedance reduction conductor is configured to substantially tune the antenna to the first and second different frequency bands.

84. [Previously Presented] The remote communication device according to claim 83 wherein the antenna comprises a dipole antenna, and the impedance reduction conductor is coupled with one half of the dipole antenna.

85. [Previously Presented] The wireless communication system according to claim 31 wherein the interrogator is configured to output a continuous wave signal and the remote communication device is configured to backscatter modulate the continuous wave signal to output the return signals.